

MAR 28 2008

**Amendments to the Specification**

Please replace the paragraph beginning on page 1, line 5 under the heading "Cross-Reference to Related Applications" with the following amended version of that paragraph:

This application is a continuation-in-part claiming priority under 35 USC 120 from US Patent Application No. ~~\_\_\_\_\_ (Attorney Docket No. NOVLP089)~~, 10/800,377 (issued as U.S. Patent No. 7,265,061), filed on March 11, 2004, titled "Method and Apparatus for UV Exposure for Porogen Removal and Film Hardening for Application in Formation of Porous Ultra-Low Dielectric Constant Materials," by Easwar Srinivasan et al., which application is incorporated herein by reference in its entirety for all purposes. This application is also related to US Patent Application No. 10/672,311, filed on September 26, 2003, titled "Method of Porogen Removal from Porous Low-k Films using UV Radiation," by Adrienne Tipton et al.; US Patent Application No. 10/404,693, filed on March 31, 2003, titled "Method for Forming Porous Films by Porogen Removal Combined with In Situ Surface Modification," by Raashina Humayun et al.; and US Patent Application No. 10/672,305 filed on September 26, 2003, titled "Method for Removal of Porogens from Porous Low-k Films Using Supercritical Fluids," by Adrienne Tipton et al., which applications are incorporated herein by reference in its entirety for all purposes.

Please replace the paragraph beginning on page 3, line 6 with the following amended version of that paragraph:

Once the porogen component is removed from the precursor film, the resulting dielectric film contains voids and reduces the overall dielectric constant of the film. However, this general approach will also reduce the density of the film and may sacrifice the mechanical strength and thermo-mechanical properties of the film. Since dielectric films can be subjected to severe thermal and mechanical conditions in IC processes such as chemical mechanical polishing (CMP) and packaging, these porous films need to have sufficient mechanical strength to withstand these processes. To address these issues, US Patent Application No. 10/800,377 (issued as U.S. Patent No. 7,265,061) ~~\_\_\_\_\_ (Attorney Docket No. NOVLP089)~~, by Srinivasan et al. (which application was previously incorporated by reference) describes UV radiation exposure methods to increase the mechanical strength of low-k porous films. In that application, it is shown that UV radiation can strengthen the dielectric network of the low-k porous film, possibly by partially reconstructing bonds within the film.

Please replace the paragraph beginning on page 4, line 26 with the following amended version of that paragraph:

One preferred class of porogen compounds is the polyfunctional cyclic non-aromatic compounds. Examples of such compounds are ~~pienes~~ pinenes such as ~~beta-piene~~ beta-pinene and ~~alpha-piene~~ alpha-pinene. Additional preferred porogen compounds include compounds with multiple reactive sites, such as  $-\text{CH}=\text{CH}_2$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{C}\equiv\text{CH}$ ,  $-\text{C}\equiv\text{C}-$ ,  $-\text{C}=\text{O}$ ,  $-\text{OCH}_3$ . Typical examples of these compounds are 1,2,3,4-tetramethyl-1,3-cyclopentadiene (TMCP) ( $\text{C}_9\text{H}_{14}$ ), 5-ethylidene-2-norbornene (ENB) ( $\text{C}_9\text{H}_{12}$ ) and methyl methacrylate (MMA). Another class of porogen compounds is template forming compounds such as certain block copolymer materials used to form ordered mesoporous films. In a somewhat different approach, the porogen and structure former exist in the same precursor molecule. After creating a precursor layer of such material, the layer is treated to remove the porogen from the composition, while leaving the structure former. Examples of these types of compounds are various organic silanes, such as di-*tert*-butyl-silane, that possess bulky organic groups. The *tert*-butyl group can be driven from the deposited silicon-oxygen matrix to leave behind small pores. Additional examples include 5-(bicycloheptenyl)methyldimethoxysilane (BMDS) ( $\text{SiC}_{10}\text{O}_2\text{H}_{18}$ ) and 5-(bicycloheptenyl)triethoxysilane (BTS) ( $\text{SiC}_{13}\text{O}_3\text{H}_{24}$ ). Generally, the precursor film in (a) can be formed using any number of different processes. Many implementations involve CVD processes (e.g., a plasma enhanced chemical vapor deposition (PECVD) technique). Other deposition techniques include spin-on processes and other condensed phase techniques.

Please replace the paragraph beginning on page 16, line 17 with the following amended version of that paragraph:

A suitable UV chamber cleaning procedure is described further in US Patent Application No. 10/800,377 (issued as U.S. Patent No. 7,265,061) ~~\_\_\_\_\_~~ (Attorney Docket No. NOVLP089), which this application claims priority from and which is incorporated in its entirety herein.

Please replace the paragraph beginning on page 18, line 17 with the following amended version of that paragraph:

Note that UV light source 231 may be a single UV source or an array of UV sources, such as an array of UV lamps. In this example, UV light source 213 is mounted outside the

chamber 205. In alternate embodiments, the UV light source array is housed inside chamber 205. Note that the invention is not limited to any particular types UV light sources. Suitable UV sources include xenon, mercury and deuterium lamps or lasers (e.g., excimer lasers and tunable variations of various lasers). Various optical elements may be required to direct the UV light toward portions of the substrate. Methods for directing the light at different portions of the substrate at different times will be required as well. A scanning mechanism may be used for this purpose. Examples of other suitable UV chamber apparatus configurations are presented in US Patent Application No. 10/800,377 (issued as U.S. Patent No. 7,265,061) ~~\_\_\_\_\_~~ (Attorney Docket No. ~~NOVLP089~~), which this application claims priority from and which is incorporated in its entirety herein.